

Palmoplantar dermatitis may be due to phenol-formaldehyde resin contact dermatitis

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Both mercaptobenzothiazole (MBT) and p-tert-butylphenol-formaldehyde resin (PTBP) cause shoe dermatitis (1). Concurrent hand dermatitis occurs in MBT allergy and hand dermatitis may present secondarily to a primary contact dermatitis of the feet (2). Occupational hand dermatitis from phenol-formaldehyde resins is recognized (3). Palmo-plantar dermatitis from phenol-formaldehyde resins could present in a similar frashion to MBT allergy. We assessed 7 consecutive cases of foot dermatitis from phenol-formaldehyde resins to see if hand dermatitis was also a presenting feature.

Case Reports

Case no. 1.

A 50-year-old non-atopic woman presented with a 2-year history of eczema on the pressure ares of the feet. Her hands showed no involvement. Her hobbies included aerobics and running. She was patch test positive to PTBP 1% pet. (+++), phenol formaldehyde resin (resol) (PFR-2) 5% pet. (+++), and her own sports shoe linin (++), with cross-sensitization to colophony (++) and balsam of Peru (++) . Her symptoms resolved on avoidance of sports shoes and on exercising barefoot.

Case no. 2

A 35-year-old non-atopic car mechanic presented with an 18-month history of hand and foot dermatitis. He was patch test positive to PTBP (++), the insole of his trainers (++) and Kathon CG (++) . He was not apparently using preparations containing Kathon CG at home or at work and this was not considered relevant. On changing footwear, his symptoms resolved.

Case no. 3

A 40-year-old non-atopic woman presented with a 2-year history of eczema on the dorsum of the feet. Her hands were unaffected. She was patch test positive to PTB (+), p-tert-butylcatechol 1% pet. (+) and nickel (++) . Her symptoms settled on changing her footwear.

Case no. 4

A 45-year-old non-atopic woman presented with a 6-month history of dermatitis over the soles and dorsum of the feet without hand involvement. Her hobby was collecting and wearing fashionable shoes. Patch testing showed positive reactions to PTBP (++), PFR-2 (+) and p-tert-butylcatechol (+). Her symptoms settled on a restricted footwear collection that is phenol-formaldehyde resin free.

Case no. 5

A 70-year-old retired printer presented with a 30-year history of eczema on the palms and borders of all the fingers, which he claimed was worse after long car journeys. Examination also revealed eczema over the borders of the soles, which he was less concerned about. Patch testing showed a positive reaction to PTBP (+). His symptoms resolved on changing footwear and wearing non-leather gloves to avoid handling the leather-covered car steering wheel (4). Prior sensitization may have taken place at this patient's previous work environment, since phenol-formaldehyde resins are used in printing (5).

Case no. 6

A 47-year-old non-atopic man presented with a 2-year history of hyperkeratotic hand and foot eczema. He originally worked as a laminator in a fibreglass factory and noticed a marked improvement of his hands on becoming a finisher in the same factory. Patch testing showed positive reactions to PFR-2 (+++) and phenol-formaldehyde resin acid (novolac) 5% pet. (++). Further reduction in occupational exposure improved his hands; he did not change his footwear.

Case no. 7

A 45-year-old non-atopic postman had hand and foot eczema for 14 months. Patch testing showed positive reactions to chrome (+++), PFR-2 (++) and the insole of his own shoes (++) . On wearing non-leather gloves at work and changing footwear, his symptoms settled.

Discussion

All our patients showed relevant delayed hypersensitivity to a range of phenol-formaldehyde resins. 43% had foot dermatitis alone and 57% had hand and foot dermatitis. The majority of palmoplantar dermatitis is endogenous; however, patients with hand dermatitis should be examined for foot dermatitis, and, if found, then shoe dermatitis with hand involvement may be suspected from either MBT or phenol-formaldehyde resins. Phenol-formaldehyde polymers are formed by reaction of phenol, or a mixture of phenols, and formaldehyde. They are used in glues, wood preservatives, adhesives, impregnation of textiles and paper and printing ink (4-6). Phenol-formaldehyde resins do not always cross-sensitize, and it may be necessary to test with a series of phenol-formaldehyde resins to confirm a relevant positive reaction. Relevant positive cases will be missed if PTBP in the standard series is solely relied upon (3, 7).

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Contact sensitivity induced by neomycin with cross-sensitivity to other aminoglycoside antibiotics

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Neomycin, called fradiomycin in Japan, is widely used as a topical antibiotic (1) and is in the European and North American standard series (2). Storrs et al. (3) reported that 6.6% of the patients with suspected allergic contact dermatitis showed a positive reaction on patch testing with neomycin, and positive responses to neomycin in cases of eyelid dermatitis rose to 11.8% (4).

Case Reports

Case no. 1. A 46-year-old woman was seen in June 1997 with contact dermatitis due to ophthalmics.

Case no. 2. A 74-year-old man was seen in January 1998, because of suspected allergy to Sofratulle® (Hoechst Marion Roussel Co. Ltd., Tokyo, Japan), a dressing containing neomycin sulfate, and Rinderon VG ointment® (Shionogi), containing gentamicin.

Materials and Methods

Using Finn Chambers (Epitest Ltd Oy, Tuusula, Finland), and Scanpor tape (Norgesplaster A/S, Norway), we carried out 2-day closed patch testing in both cases.

Case no. 1. We performed patch tests with the ingredients of Rinderon A® solution or ointment, with 10% pet. of paromomycin, tobramycin, gentamicin, kanamycin, streptomycin, dibekacin, amikacin, and arbekacin, some of which were previously reported as neomycin cross-reactors (1), and with 5% pet. of isepamicin.

Case no. 2. We performed patch tests with 10% pet. of neomycin, paromomycin, tobramycin, gentamicin, kanamycin, amikacin, arbekacin, astromycin, dibekacin, spectinomycin, ribostamycin, and streptomycin, and with 5% pet. of isepamicin.

Results

Case no. 1. Neomycin 0.35% pet. was positive, and paromomycin, tobramycin, gentamicin, kanamycin, amikacin, and isepamicin in pet. produced erythema and small papules with pruritus at D3.

Case no. 2. Neomycin, paromomycin, tobramycin, gentamicin, kanamycin, amikacin, ribostamycin, and isepamicin in pet. produced erythema and small papules with pruritus at D2 and D3.

Discussion

Kanamycin, gentamicin, paromomycin, spectinomycin, and tobramycin are known neomycin cross-reactors (1, 5). Since paromomycin has a common structure (4, 5-di-O-substituted deoxystreptamine) with neomycin, almost all cases of neomycin allergy cross-react with paromomycin (1, 5) (Fig. 1). Gentamicin and kanamycin, which have 4,6-di-O-substituted deoxystreptamine, cross-react with neomycin less often (1, 5). Cross-sensitivity to tobramycin, which has 4,6-di-O-substituted deoxystreptamine and 3-deoxyneosamine, is seen in 65% of neomycin-allergic patients (1, 6), because 3-deoxy neosamine is very similar to the neosamine of neomycin.

Hara et al. (7) reported, in a case of drug eruption induced by kanamycin sulfate, cross-sensitivity with neomycin, gentamicin, tobramycin, dibekacin, amikacin, amikacin, isepamicin, and arbekacin, but not streptomycin and astromycin (7). Streptomycin has no common structures with neomycin, and cross-sensitivity with streptomycin was not shown in our cases. Neomycin has the same main structures, neosamine and deoxystreptamine, as ribostamycin (Fig. 1).